Space Weather Forecast

Issued on Monday 25 November 2024 at 12:05 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate Solar Activity likely, slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate solar activity has been observed in the last 24 hours, with a peak high level Moderate flare at 25/0742 UTC from a region located beyond the NE limb.

There are currently ten sunspot regions on the visible disc. The largest and most magnetically complex regions are in close proximity and located in the southeast quadrant with continued minor development of their interior spots. The remaining spots on the disc are smaller and less magnetically complex, with little change in overall appearance. However, bright flux and associated flare activity near the northeast limb indicates a new active region soon to emerge over the eastern horizon.

No Earth-directed CMEs (Coronal Mass Ejections) were observed. However, a filament lift-off beginning around 25/0140 UTC from the southeast quadrant has produced a CME. This is still being analysed pending updated imagery, but initial assessment is that most of the ejecta is directed south of the Sun-Earth line.

Solar Wind / Geomagnetic Activity: Solar winds were were between Background and Slightly Elevated levels, due to minor influence from a coronal hole in the southwest disc. Wind speeds generally varied between 400-450km/s, but with a peak of 472km/s observed at 22/2156 UTC. The Interplanetary Magnetic Field, Bt, was Weak to Moderate, with the north-south component varying weakly, but with a more persistent southward directed component observed between 24/2000-25/0200 UTC. Geomagnetic activity was mainly Quiet (Kp 0-2), but increased to become Unsettled to Active (Kp 3-4) between 24/2100-25/0300 UTC.

Energetic Particles / Solar Radiation: Solar radiation remained at Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with isolated Moderate-class flares likely and a slight chance of Strong flares, primarily from the largest regions in the southeast disc, or a returning region currently located close to the northeast limb.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Wind / Geomagnetic Activity: There are currently no Earth-directed CMEs in the forecast. Ongoing Slightly Elevated wind speeds may briefly become Elevated on Day 1 (25 Nov) period due to an enhancement from a small coronal hole in the southwest disc. However, any significant connection appears unlikely and speeds are expected to ease to Background levels in the coming days.

Geomagnetic activity is expected to be mainly Quiet to Unsettled through the period, but with a chance of further Active (Kp4) intervals early on Day 1 (25 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at Background levels, with a slight but rising chance of enhancement during the period, mainly from the regions in the southeast.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	65	70	70	70
Very Active	R3-R5 (X Class)	No	10	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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